EXHIBIT 2

YEADON ENGINEERING SERVICES, P.C.

LAURA BECHTEL
and
TROY THOENNES, on behalf
of themselves and all
others similarly situated,
Plaintiffs,

vs.

FITNESS EQUIPMENT
SERVICES, LLC dba SOLE
FITNESS,
Defendant.

CASE NO.: 1:19-cv-00726

Rebuttal Report

Prepared for:

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Introduction

1. I write this in response to both the report of S-E-A by Mr. Bainbridge filed March 2, 2021 (Doc. 45-1 "S-E-A Report") and the deposition testimony of Mr. Bainbridge on April 16, 2020. I respond to the primary inaccuracies in the report and testimony; a failure to address a particular point on my part should not be construed as agreeing with that point.

2. As I would expect - given that they are based on readily accepted engineering calculations - Mr. Bainbridge agrees with the key technical conclusions set out in my initial report (Doc. 38-4 "Report") as follows:

   - Mr. Bainbridge agrees that a 120V/60Hz 15A household circuit breaker delivers a maximum continuous input power of 1800W to the treadmill.[1]

   - Mr. Bainbridge agrees that the actual horsepower output of the motor based on such a household circuit breaker would, based on standard electrical engineering calculations, be capped at 2.41HP if the power input was provided to a perfectly efficient motor.[2]

   - Mr. Bainbridge agrees that, due to inefficiencies, the actual horsepower output of a motor attached to a typical residential circuit would be less than 2.41Hp.[3]

   - Mr. Bainbridge agrees that, even without testing, it is clear that none of the Sole treadmills could continuously produce 2.5HP in operation on a typical residential circuit.[4]

[1] Bainbridge Dep. at 113:8-13.

[2] Bainbridge Dep. at 123:9-12.

[3] *Id.*

[4] Bainbridge Dep. at 123:16-20.

3. In his Report and testimony, Mr. Bainbridge attempts to escape the impact of these conclusions in two ways. First, by providing a definition of "continuous horsepower" that is contrary to that accepted in the treadmill industry, that is contrary to common sense and language, and that generally describes what is commonly referred to as "peak horsepower" not "continuous horsepower." Second, by focusing on the ability of a treadmill to periodically and temporarily draw power greater than 1800W from a typical residential circuit, which is irrelevant given that: i) a treadmill cannot "continuously" do so without tripping the circuit; and more importantly ii) the input power to the treadmill is not at issue—it is the horsepower output that is overstated. These concepts are addressed in more detail in responding to specific claims in the S-E-A Report and Mr. Bainbridge's testimony below.

Mr. Bainbridge's Conclusions Are Irrelevant, Incorrect, or Both.

4. The S-E-A Report presents six bullet-pointed conclusions at the outset. These will be addressed in turn.

5. In his first conclusion, Mr. Bainbridge notes that "There has been no evidence presented to S-E-A to indicate that users of Sole treadmills are not receiving the necessary motor output to meet the various demands of their individual workouts." (S-E-A Report at 5). I agree that it is unclear whether Sole treadmill users are receiving the necessary motor output to meet the demands of their workouts. I did not examine this issue, nor do I intend to, because it is outside the scope of my assignment, which was to determine whether SOLE's claims of continuous horsepower output were true. S-E-A's own testing reports a maximum estimated output horsepower in operation below Sole's claimed horsepower. Moreover, it would seem to me that if all SOLE treadmills meet the demands of users with a horsepower output in the range of 1.75HP, S-E-A's conclusion just supports the idea that there is no reason for a user to pay more for a treadmill with, for example, represented continuous horsepower of 3.5 as opposed to one with represented continuous horsepower of 3.0.

6. In his second conclusion, Mr. Bainbridge asserts that S-E-A has demonstrated that a SOLE treadmill can draw power from a circuit in excess of 15A without tripping the circuit breaker, and therefore can exceed 2.75 HP input. (S-E-A Report at 6). The key issue—an issue not disputed by Mr. Bainbridge—is that a SOLE treadmill cannot *continuously* draw power from a circuit in excess of

15 A without tripping the circuit breaker. (See Appendix A of this report for an explanation of alternating motor loads with supporting data showing limiting components of treadmill horsepower).

7. In addition, it is misleading for Mr. Bainbridge to speak about horsepower "input." "Horsepower" is acknowledged in engineering to be a measure of "output." (Reference NEMA standard MG-1). The horsepower of motors is not referenced in terms of what power can be inputted, but what power is outputted. The only reason to reference horsepower with regard to input is to note, as I did in my original report, that with an input of 15A or 1800W the maximum horsepower output—with a theoretically perfectly efficient motor—would be approximately 2.41 HP. (Electrical input power can be converted to a horsepower output equivalent by dividing the input power in watts by approximately 745.7).

8. In his third conclusion, Mr. Bainbridge agrees that the data collected by S-E-A was consistent with the data collected by YES, but faults YES for limited test results using only one user. (S-E-A Report at 6). Mr. Bainbridge argues that dynamometer testing is not representative of a variable treadmill duty load, and that S-E-A has demonstrated that the output in YES's tests can be exceeded. *Id*. First, there was no reason to conduct tests with more than one person or more than one treadmill. The tests performed by YES, substantiated by S-E-A, demonstrated that the horsepower *output* of *all* SOLE treadmills in operation cannot come close to the "continuous horsepower" represented by SOLE (this is true even without the "continuous"). Second, it is only in laboratory dynamometer testing—the typical testing performed by motor manufacturers to measure horsepower output—that at amperage well beyond the continuous capability of household circuits the represented horsepower output can come close to being achieved. Mr. Bainbridge and S-E-A are improperly correlating an increase in input power as a function of user weight, not motor output power.

9. In his fourth conclusion, Mr. Bainbridge asserts that S-E-A has demonstrated that the "maximum output power" established by YES can be exceeded by a heavier user, and therefore YES's testing did not establish the maximum possible power output of the F80 during use. (S-E-A Report at 6). The testing I performed demonstrated that with a 188 lb. user the maximum power output in operation of an F80 treadmill motor was 1.758HP when operated with a

PWM controller.[5] While it is possible that a heavier user might cause an increase in horsepower *input* to the motor (if not constrained by the PWM), the evidence from testing by both YES and S-E-A is that the horsepower *output* with a heavier user would still not come close to approaching the output HP represented by SOLE in operation.

10. In his fifth conclusion, Mr. Bainbridge asserts that the motor nameplate rating of "3.5 CHP" does not imply that the motor "will always or ever deliver that much power, it is simply the upper threshold of treadmill-duty loading the motor can sustain without incurring damage." I have no idea of the basis for this conclusion, which is contrary to generally accepted terminology in the industry.

11. In the treadmill industry, the term "continuous horsepower" or CHP is used to describe the horsepower output of a treadmill motor in operation. Dick's Sporting Goods, the largest retailer of Sole treadmills, describes CHP in its buying guides as "how much power the motor maintains throughout the workout" or "the measure of how much power the motor maintains throughout the workout" (Doc. 38-7). Similarly, the online "treadmill reviews" guide states: "CHP is the most useful thing to take into consideration because it indicates how much power a motor can put out continuously versus just at its peak." https://www.treadmillreviews.net/treadmill-buyers-guide/. Another treadmill buyer's guide says CHP refers "to the motor's ability to perform continuously, as opposed to at its peak, which can't be sustained for a long period of time." https://www.startstanding.org/treadmills/. Another states CHP "measures the minimum horsepower delivered at all points during a workout." https://www.johnsonfitness.com/blog/treadmill_drive_motors_and_the_question_of_horsepower/. This use of CHP or "continuous horsepower" is common and recognized when describing the horsepower of treadmill motors.

12. It is also contrary to common language to suggest that "continuous" horsepower is in fact periodic and maximum horsepower. What Mr. Bainbridge describes is essentially what is often described as "peak

[5] The PWM is "providing voltage regulation" which "reduces the available power." Bainbridge Depo. 59:16-25.

horsepower."[6] The F80 motor, for example, is capable of delivering 3.5HP on a continuous basis only in a laboratory setting with an electrical current much greater than what a typical residential circuit can supply, the treadmill components limit the CHP in operation to approximately 1.77CHP—much lower than represented.

13. In his sixth and final conclusion, Mr. Bainbridge asserts that "since the basis of the F80 testing by YES was limited to an incomplete data set, it would be erroneous to make a correlation to other SOLE treadmill models based on this data." (S-E-A Report at 6). I disagree. First, the evidence indicates no difference in the treadmill PWM boards, which Mr. Bainbridge acknowledges limit horsepower output. Second, there is little difference in motors: the evidence indicates that SOLE used two different motors, and for many models used the same motor with simply different horsepower labels. Finally, S-E-A's testing itself confirmed that the models presented similar limitations on horsepower output, limitations that prevent every model from attaining its represented continuous horsepower. One is not required to test all treadmills rated at 120V 15A to confirm continuous output power capability. The continuous power capability of the typical residential circuit in this case (1800W) limits the absolute maximum output power to approximately 2.41HP. The actual motor output power must be less than this value once motor losses and efficiency are considered as demonstrated in my prior report and Appendix A of this rebuttal.

Mr. Bainbridge's Deposition Testimony

14. In his deposition, Mr. Bainbridge admitted to a number of propositions that provide further support for my opinions and conclusions, including:

- With respect to motors, "horsepower" is output power. (Bainbridge Dp. At 45:19-21).

[6] For example, one online treadmill buying guide states: "Continuous-duty is the horsepower rating for steady, continual, 24 hour motor usage while Peak horsepower is the motor's maximum potential at various moments in usage, but cannot be maintained for a considerable length of time." See https://www.treadmilladviser.com/how-to-shop-for-a-treadmill.html. Another cautions "Be careful to know CHP vs peak HP," with peak HP defined generally in the way Mr. Bainbridge attempts to define CHP. https://fitdel.com/blog/treadmills-and-horsepower.

- What rating electric motors for horsepower, the horsepower is based on output power, not input power. (Bainbridge Dep. at 46:15-18).

- Treadmill motors fall under an "S9" classification, which are motors rated under a "reference load" which is continuous duty. (Bainbridge Dep. at 48:6-12, 49:14-21).

- The PWM or "pulse width modulation" board associated with Sole treadmills regulates the voltage to the motor; it is not a "turbocharger" (as claimed by Mr. McFarlane) and it does not in any way enhance or boost the input power to the motor. (Bainbridge Dep. at 60:2-7, 91:4-14).

- With the PWM in place, S-E-A was not able to get the motor above an output power of 3HP even in a laboratory setting using a dynamometer. (Bainbridge Dep. at 76:1-13).

- Mr. Bainbridge has seen no indication that a 4.0 CHP motor provides a smoother ride than a 3.0 CHP motor, or that it gets to speed faster or provides easier transitions. (Bainbridge Dep. at 73:11-22).

- S-E-A testing did not show output power for any Sole treadmill motor exceeding 2.75HP. (Bainbridge Dep. at 80: 18-21).

- S-E-A did no testing that showed the F80 could produce 3.5HP either continuously or at any time in normal operation. (Bainbridge Dep. at 112:9-22).

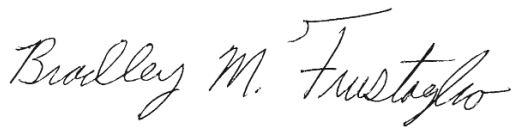
- It would not be accurate to say that F80 treadmills produce 3.5 CHP during ordinary household use. (Bainbridge Dep. at 119:18-24).

Further Testing by YES

15. Partially in response to Mr. Bainbridge's testimony, YES sought to determine the effect of the treadmill components, including the PWM board, on motor output in a laboratory setting (i.e. a setting where the power input was not limited to that of a typical residential circuit and the output was tested on a

dynamometer). Our testing showed that the input power could not be increased beyond approximately 20.5A, generating maximum output power of approximately 1.77HP, before the onboard treadmill circuit breaker tripped. This is explained further in attached Appendix A.

I reserve the right to supplement my report as further information becomes available.



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APPENDIX A

This appendix contains additional dynamometer test data confirming a maximum continuous HP of approximately 1.77HP for the Sole F80 treadmill, whether run steadily or cyclically.

It had previously been demonstrated in my expert report the sole F80 treadmill motor, unattached to the treadmill and with amperage well above residential circuits applied, is capable of delivering 3.5HP continuously in laboratory conditions. Testing demonstrates, however, that the components of the treadmill limit the motor horsepower output.

Test Setup

Figure 1 shows the treadmill motor test setup. The motor mounted in the treadmill is disconnected from the treadmill electronic drive and the motor mounted on the dynamometer is being driven by the treadmill controller. The power supply is a 120V 60Hz Variac connected to a 50A breaker. Connecting to a 50A breaker allows isolation of maximum continuous horsepower to the onboard treadmill components.

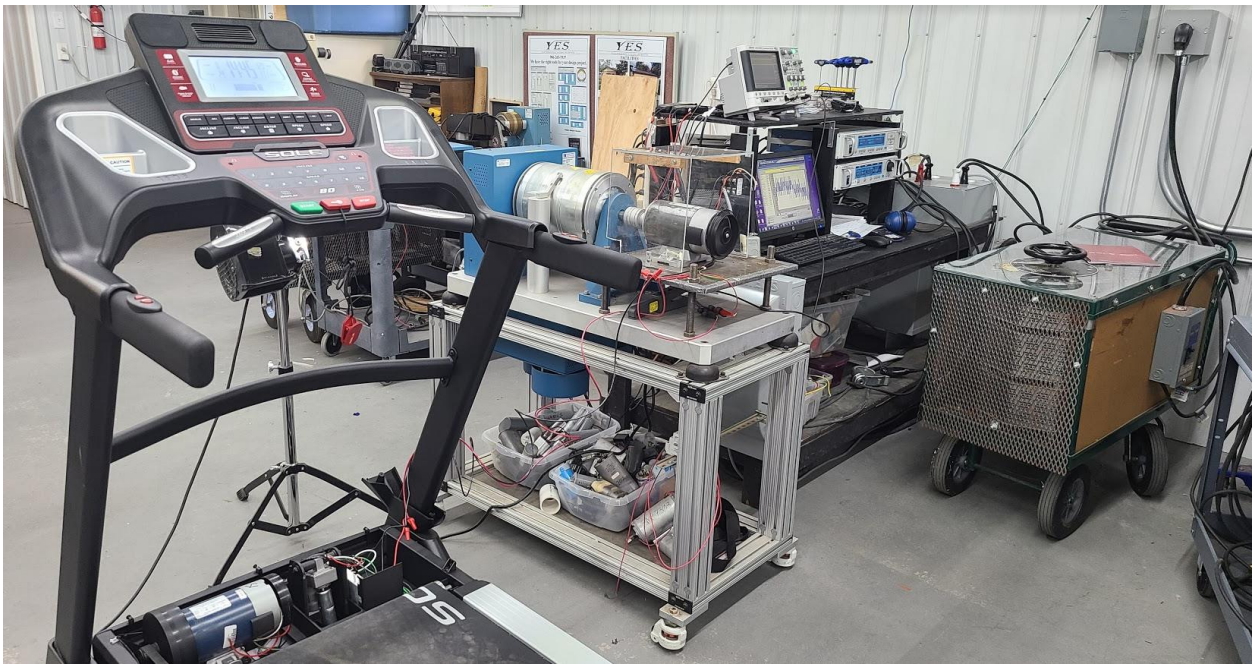

Figure 1- Treadmill Motor Dynamometer Test Setup

Figure 2 shows the nameplate of the motor tested.

Figure 2 - Treadmill Motor Nameplate

Test 1: Non-cyclical Test

For Test 1, steadily increasing amperage yielded increasing horsepower output, limited to 1.75 HP.

The amperage ranged from 15A to 20.5A of current. Each level of amperage was held for 10 minute increments, with the assumption that if the motor could operate that amount of time it would likely be able to continue for longer periods.

The amperage levels and associated horsepower outputs were as follows:

- 15A/1.27HP
- 16A/1.32HP
- 17A/1.41HP
- 18A/1.52HP
- 19A/1.63HP
- 20A/1.73HP
- 20.5A/1.75HP

At 20.5A/1.75HP the onboard treadmill circuit breaker tripped. This confirms the approximate maximum continuous horsepower rating of 1.77HP in my prior report. The tripped breaker is shown in figure 3.

Test 2: Cyclical Test

This test represents a foot strike by varying the dynamometer torque load in a cyclical manner. Mr. Bainbridge states that a treadmill motor falls under an S9 classification Bainbridge Dep. at 48:6-9. Under that classification, the horsepower rating of the motor is determined by the reference load or RMS value. A cyclical dynamometer load resulted in an RMS power output of 1.77HP. When the load was increased beyond this amount to 1.85HP RMS the onboard breaker tripped after a short period. This cyclical test confirmed that the HP output resulting from either steady or cyclical input is limited to between 1.75-1.77HP.

Figure 3 – Treadmill 15A breaker

Equipment Used

- Magtrol HD-815 Dynamometer
- Magtrol 6530 Power Analyzer
- Magtrol 6001 Dynamometer Controller
- Variac 60Hz 0-280V power supply